VII. *On Parts of the Skeleton of* Meiolania platyceps (Ow.).

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[PLATES 31–37.]

SINCE my last communication to the Royal Society (March 15, 1886) of the characters of some fossil bones of a *Meiolania* from Lord Howe's Island, I have been favoured with the opportunity of inspecting a second and richer series of remains of the same extinct genus of Reptile from the same island and formation.

These fossils have been liberally transmitted by CHARLES WILKINSON, Esq., F.G.S., F.L.S., Government Geologist of the Department of Mines, Sydney, to the Geological Department of the British Museum of Natural History, and have been confided by the Keeper, Dr. WOODWARD, F.R.S., for their development from the matrix, to Mr. RICHARD HALL, Assistant Mason in that Department, whose name deserves to be recorded for the patient devotion and admirable skill with which he has brought to light the manifold and complex evidences of osseous structure, especially of the cranial and some vertebral parts of the petrified skeletons of the present singular genus of extinct Reptile.

The subjects of Plates 31–34 give four views of the skull of *Meiolania platyceps.* Plate 31 gives a side view; Plate 32 represents the base of the skull, with three attached vertebræ; Plate 33 shows the outer plate of the cranial wall, with the horn-cores; Plate 34, the back view. All the figures are of the natural size.

With the exception of the outer plate of the cranial wall, the subject of Plate 31 includes the rest of the skull, of which the facial division shows the orbits, *o*, the outer nostril, *n*, and both upper, *m*, and lower, *g*, jaw-bones. The auditory chamber has its external osseous aperture, 1 inch in diameter, at the side of the cranium, 2½ inches behind the orbit. In Plate 32, at the under part of the tract, between the par-, *b*, and ex-, *c*, occipitals, are the pair of long and slender auditory ossicles, *e*, slightly expanding where they enter the matrix which blocks up the *meatus auditorius internus*, *v*.

The side view of this skull (Plate 31) shows an almost vertical tract of bone, extending from the auditory, *p*, to the optic, *o*, foramen. It descends from the upper surface of the cranium with a slight bend outward, ending below in a sharp margin,

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until it expands into the sub-auditory enlargement, developing the joint for the mandibular condyle. The above-described vertical side-plate include the post-frontal, *w*, and mastoid, *x*, above, the malar, *m*, and zygomatic, *z*, bones below. These are distinct and separate bones in the *Chelonia* (Tortoise) and most existing Reptiles, but are here confluent with each other and contiguous parts of the skull.

Turning to the base of the skull (Plate 32), the lower border of the single occipital condyle, *a*, appears anterior to the joint with the atlas, *va*. In advance of this, a pair of ridges diverge and expand to coalesce with the broader basisphenoid, *f*, forming on each side, behind, a thick angular prominence. In advance of these, the sides of the coalesced basi- and presphenoids extend outwards, expanding into a convex roof of the auditory outer chamber, and coalescing with the articular process, *g*, for the mandibular joint. The hind border of the bony palate (Plate 32), *h*, completes below the transverse slit-shaped single inner or hinder nostril, *h′*, the roof or sides of which are formed by the basi- and presphenoids; the backward position of this aperture and concomitant extent of the bony palate bespeak the Saurian affinity of this extinct toothless Reptile. The cornua, *l*, *l*, of the os hyoides have been preserved in the present skull, each 3 inches in length, one-third of an inch in thickness at their obtuse inner or mesial ends, here adherent to the basisphenoid; they slightly taper to the outer obtuse end, also adherent by matrix to the paroccipital, *b*.

Returning to the facial portion of the present skull (Plate 31), the orbital contour, *o*, is subtriangular, the angles rounded off, and the apex directed forward; the longitudinal diameter of the visual aperture is 40 mm., the vertical one, 35 mm.

The inner or mesial wall of the orbit is entire, and is separated by a wide interspace of the broad facial part of the skull of *Meiolania* from the mesial bony wall of the opposite side. They do not communicate, as in *Chelonia*, with the nasal chamber; this extends backward with walls unbroken by such communication. About 25 mm. extent of the malo-maxillary tract, *l*, *m*, leads from the orbit to the single outer nostril, *n*. This aperture is 40 mm. in transverse, 20 mm. in vertical diameter; the fore-margin of the bony septum is concave, it rises about 10 mm. behind the lower boundary of the nostril to coalesce with the roof of the nasal passages. In Chelonian Reptiles the sutures persist which indicate the six several facial bones which enter into the frame of the anterior or external nostrils.* From the nostril the upper jaw descends obliquely backward to terminate in its trenchant toothless border. This border shows a small median notch. It extends a little in advance of the corresponding border of the under jaw, *q*. The interspace left by the fossil between these borders may be interpreted as having been occupied by the part of the trenchant horny sheath forming the beak of the Megalanian Reptiles.

Of the mandible, *q*, the length of each ramus from the angle to the symphysis, in a straight line, is 120 mm.; the greatest depth of the ramus is 38 mm., this is a little behind the plane of the orbit. The angle of the jaw, *r*, extends 8 mm. behind the

* See CUVIER, 'Leçons d'Anatomie Comparée,' 2e éd., 1837, vol. 2, p. 501.

glenoid cavity, in form of a subvertical ridge inclined backward and inward. The outer roughish surface of the mandible bulges slightly beneath the fore part of the broad zygoma. There is no marginal extension of the mandibular ramus meriting the name of "coronoid process," and no indication of sutures of the usual constituents of the lower jaw in the Reptilian class.

On the upper surface of the facial part of the skull, a subcircular vacuity, due to fracture, about 30 mm. behind the upper border of the nostril, indicates the position of a broken-off core of the nasal horn.

The bony palate (Plate 32), *h*, 3 inches in length, 2 inches in breadth, is concave, has a medial longitudinal ridge, and a pair of lateral lower ones: it terminates behind in a vertically narrow, transversely extended, post-narial aperture, *h*, 30 mm. in extent. On each side of this aperture the bony palate is continued into the lateral expansion of the basi-pre-sphenoid, *f*, *g*. To these are attached, by matrix, the hyoid cornua, *i*, *i*.

The length of the skull from the super-occipital border to the outer nostril, the boundary of which is the foremost part of the cranium, is 7 inches: the upper surface of the skull thus forms an equilateral triangle.

A second cranial specimen (Plates 33 and 34) supplies what is wanting in the one above described. It includes the hind portion of the skull. The single occipital condyle, *a*, has suffered only a slight abrasion of the surface. The super-occipital ridge, *d*, extends from the occipital foramen, *w*, upwards and backwards, ending in a sharp border behind, but expanding as it ascends to support the backward continuation of the outer wall of the cranium (Plates 31 and 34), *x*, which terminates in an obtuse free margin, describing an arch, the supports or wings of which coalesce with the outer osseous expansions developing the processes affording the articular surfaces, *u*, *u*, for the mandibular condyles.

The supra-cranial wall includes the cores of the low hindmost pair, *c*, of horns. The larger cores, *b*, rise in advance of and exterior to these; the length of this core, in the subject of Plates 33 and 34, is 2 inches. The cores of the antero-lateral horns, *a*, are low, small, obtusely ridged processes, the longest basal diameter not exceeding 1 inch. The outer, horn-supporting, wall of the skull (Plate 34), *x*, *x*, is here preserved for an extent forwards of $5\frac{1}{2}$ inches, where the rest of the skull has been broken away; the breadth of the preserved calvarium is 7 inches. In advance of the larger horn-cores is a pair of low convexities, due to thickening of the bony plate, each about 2 inches in diameter. The sides of this portion of skull-plate bend down at a right angle, (Plate 34), *x*, *x*, with a slight partial prominence, to the part where a thick bony extension of the inner surface contributes to support the glenoid articular surface, *u*, for the condyle of the lower jaw.

The external auditory aperture (Plate 31, *p*), is about 1 inch from the lower border of this part of the outer wall of the cranium and $1\frac{1}{2}$ inch below the base of the anterior horn-core, its vertical diameter is $1\frac{1}{4}$ inch, its transverse diameter is 1 inch. A wide, irregular "meatus" open below (Plate 32), *p′*, extends for 2 inches before attaining the opening (*meatus internus*) at the side of the inner or proper cranial wall of the acoustic chamber. In these wide passages lay the slender, long *ossicula auditus* preserved in the preceding cranial subject. In the subject of Plate 34 are seen the strong outward extensions of the confluent exoccipitals and alisphenoids, 2–5, which expand and coalesce with the parts of the outer cranial wall supporting the first and second pairs of horn-cores.

To the skull, the subject of Plate 32, are cemented by matrix the three anterior vertebræ, *va, vb, vc,* the atlantal ring is completed below by a hypapophysis confluent with the neural arch, developing a low obtuse transverse process on each side, and a broader depressed plate representing the neural spine. The true "centrum" of the atlas has coalesced with that of the second or "axis" vertebra, *vb,* as the "odontoid process." The body of a third cervical vertebra, *vc,* retains the proximal end of the rib of one side, showing a well-developed "head" and "tubercle," partially dislocated from the vertebra. The body of this segment of the spine is flattened beneath and expands as it extends backward, where it presents a pair of short thick angles. A strong transverse process extends from the side of the centrum and presents an articular surface for the head of a rib.

The separate vertebræ transmitted with the cranial fossils above described exemplify modifications in the different regions of the column, but are not in numbers sufficient to yield that (numerical) character. The size concurs, however, with their colour and petrified state, as fossils, in yielding evidence of their relation to the skull of *Meiolania.* The coalescence of the neural arch and centrum repeats the evidence of individual maturity given by the attached cervical vertebræ; the separate ones present also three well-marked modifications of the terminal joints of the centrum.*

I may also premise that, in the existing Crocodiles, the centrum of the axis vertebra is flat in front, convex behind; that an anterior sacral vertebra is concave at the fore part, flat at the hind part of the centrum; a posterior sacral vertebra is flat at the fore part, concave at the hind part of the centrum; also, that the first or foremost caudal vertebra is convex at both ends of the centrum; and that the bodies of the dorso-lumbar vertebra are concave in front, convex behind. In the extinct Crocodiles of Secondary Periods below the Cretaceous Series, both articular surfaces of the centrum in the trunk-vertebræ may be slightly concave; in one Oolitic genus the fore end of the centrum is convex, the hind end concave, whence the generic name, *Strepto-spondylus,* of this fossil form. This "opisthocœlian" articulation is also shown in the cervical and anterior dorsal vertebræ of the gigantic extinct *Cetiosaurus.* Allied modifications may be seen in corresponding vertebræ of *Dinosauria* exhibited in the Geological Department of the British Museum of Natural History.

The vertebra which gives the subjects of figures 1, 2, 3, Plate 35, has the characters of one from the trunk, probably from the fore part of the dorsal region. The trans-verse processes (*d, p,* di- and par-apophyses) have shallow terminal articular surfaces

* These varieties are noted in the spinal column of several existing Chelonians.

for the "head" and "tubercle" of the pair of ribs which had been thereto articulated. The centrum is "pro-cœlian"; the "cup" (*c*, fig. 1) with its margin sharply defined; the "ball" (*c'*, fig. 3) is hemispheric and correspondingly well-defined.

The parapophyses (*p*), short and thick, are developed from the lower and fore part of the side of the centrum. Each diapophysis (*d*) is continued with a downward inclination from the base of the neurapophysis, *n*. Both these "transverse processes" have a small shallow semicircular articular cavity, for the "head" and "tubercle" respectively, of a thoracic rib. The centrum expands to form the anterior cup and contiguous parapophyses; the under surface shows posteriorly a low transverse protuberance, *t*, fig. 2, ending in lateral, low, smooth convexities, divided by a narrow groove from the lower border of the articular ball.

With the centrum the neural arch has coalesced, as in a warm-blooded Mammal, without trace of early suture. The diapophysis, *d*, short and thick, has a truncate shallow articular surface for the "tubercle" of a rib, looking downward and slightly backward. The articular concavity, *p*, on the parapophysis for the "head" of the rib, similarly shallow, is smaller, circular, and looks outward and slightly backward. The presence of both par- and diapophyses, with concomitant bifurcate proximal ends of ribs, is a character ascribed to *Dinosauria* as well as to the Reptilian orders *Anomodontia*, *Ichthyopterygia*, and *Crocodilia*.*

The neurapophysis, *n*, sends forward the prezygapophyses, figs. 1, 2, *z*, with their flat, articular surfaces directed upward and slightly inward, the postzygapophyses, figs. 2, 3, *z'*, with opposite aspects, occupy half of the vertical extension, representing a short, broad neural spine, which terminates in a mere ridge expanding behind into a low notched tuberosity. The neural canal, *nc*, indicates by its expanse a large myelon and concomitant strong muscularity. The following are dimensions of this vertebra :—

	Inches.	Lines.
Extreme breadth	2	9
,, length	2	4
,, height	3	0
Breadth of articular cup	1	5
Height of ,, ,,	1	0

Of the rich series of fossils the subject of the present paper, no vertebra, or fragment of vertebra, affords an indication of having been modified in relation to a Chelonian carapace or plastron.

A biconvex vertebra, answering to the foremost caudal in a Crocodile, is represented by the centrum only, fig. 4, Plate 35, the fractured bases of neurapophyses, *ib.*, *n*, *n*, leave by their interspace the floor of a neural canal, *n*, *c*, 1 inch 3 lines in extent, 15 mm. in breadth. The forepart of the sides of the centrum is smoothly concave, as

* 'Palæontology,' 8vo., 1850, p. 257.

if pinched in; the hinder half of the under surface shows the rough fracture whence a hæmapophysial element of some kind has been broken away.

The hæmal arches preserved in succeeding caudal vertebræ are confluent with their centrum. The dimensions of the biconvex fossil (Plate 35, fig. 4) indicate a derivation from the smaller individual *Meiolania*. Its dimensions are:—

	Inch.	Lines.
Diameter of each terminal ball .	1	0
Length of the neural canal . .	1	3
Breadth of ,, ,, . .	0	6

Three vertebræ, of probably the same individual as that which yielded the dorsal one, show, with characters relegating them to the caudal series, others, leading to the conclusion that the articular concavity of the centrum is at its hinder end, the convexity at its forepart; such conclusion is based upon the aspects of the articular surfaces of the zygapophyses and the direction or inclination of the neural and hæmal spines.

The vertebra, Plate 35, figs. 5 and 6, here described, in size, texture, and correspondence of degree of concavity and convexity of the joint-ends of the centrum, I believe to belong to the same skeleton or species as those above described. The caudal character of the subject of figs. 5 and 6 is based on the presence of the hæmal arch, *h*, here confluent with the under part of that half of the centrum which is terminally excavated, fig. 6 *c′*, to receive the ball of the next vertebra. From the middle and upper part of the side of the centrum projects a transverse process, *d*, flattened vertically and terminating obtusely; this process is 1 inch in length, 7 lines in breadth. The piers of the hæmal arch, fig. 5, *h*, are continued without trace of suture from the hinder half of the under part of the sides of the centrum, and, sloping downward and backward, are confluent with a hæmal sub-compressed spine, *hs*; this extends in the same direction for 1½ inch below the concavity of the centrum, fig. 6, *c′*, and terminates obtusely with a slight expansion. The anterior opening of the hæmal arch is slit-shaped, 1½ inch in length, 3 lines in breadth, contracting to a point above and below; the posterior outlet, fig. 6, *o*, is an elongate triangle in shape, 6 lines across above, and pointed below.

The neurapophyses, *n*, *n′*, as in the dorsal vertebra, are confluent with the centrum, *c*; their bases extend along its anterior three-fourths and terminate in the ball, *c*; their antero-posterior extent is 1½ inch; from the fore part projects the prezygapophysis, *z*, with an elongate flattened articular surface looking upward and inward. A low oblique obtuse ridge extends along the neurapophysis from the prezygapophysis obliquely backward and upward to the base of the postzygapophysis, *z*, which has its flat articular surface turned outward and slightly downward.

A low antero-posteriorly broad neural spine, *ns*, rises from the hinder two-thirds of the neural arch, with an anterior trenchant border sloping to a thicker obtuse truncate summit; from the angles of the broader hind end of this spine two ridges, fig. 6, *ns*, descend, each to the upper and back part of the corresponding postzygapophysis, *z*.

The size of the vertebra above described, from the summit of the neural spine, *ns*, to the end of the hæmal spine, *ns*, is $4\frac{1}{2}$ inches; the length of the centrum is 2 inches 10 lines; the diameter of the terminal cup is 1 inch 5 lines; it is deep, hemispheroid, with a sharp well-defined margin; the opposite ball shows a corresponding size and convexity.

As this caudal vertebra shows no sign of confluence with an enveloping dermal bony ring, but every arrangement for motion upon coarticulated vertebræ, it may be inferred to have come from a fore part of a tail, where the dermal osseous girdles were free from the vertebræ they surrounded as well as from each other.

Another caudal vertebra with the same characters as in the preceding is indicated, by the smaller size of the transverse processes and the greater size of the hæmal arch and spine, to have been a succeeding one. More fragmentary specimens indicate a tail of the proportionate length of that in the *Crocodilia*.

Limb-bones.—The best preserved of the fossils indicative of bones of the limbs of *Meiolania* is an oblong one, Plate 36, fig. 1, with well characterised proximal and distal ends, the former, fig. 1, being the largest. This is terminated by a feebly undulate articular surface, fig. 1, *a*, 2 inches by $1\frac{1}{4}$ inch in its diameters. A rough insertional surface, fig. 2, *b*, projects for 3 or 4 mm. from an extent of 1 inch 4 lines of the anterior border of the joint. A second similar but shorter oblong surface, fig. 1, *c*, projects below the insertional margin of the proximal end. Besides the two oblong insertional tracts bordering the proximal articular surface, there is a third, fig. 2, *d*, which extends from the narrower end of that surface 1 inch 9 lines down the corresponding border of the shaft; this is sub-compressed from before backward, convex across posteriorly; approaching to flatness across the proximal part of the opposite side. The shaft narrows to an obtuse margin at one side, is rounded across and thicker at the opposite side, of which the lower third develops a strong rough oblong sessile process, *e*, 1 inch in extent. The distal articular surface, fig. 4, is undulate, $1\frac{1}{2}$ inch by 10 lines in its diameters. The only trace of fracture in this bone is at *d*, fig. 2, the upper end of the insertional surface extending down the narrower border of the shaft.

I have next to notice a limb-bone, fig. 5, 4 inches 3 lines in length, 10 lines across the narrowest part of the shaft, which expands to form a distal joint, 2 inches in breadth. A part of the thicker proximal end of the bone has been broken off; the slightly concave articular surface which remains measures $1\frac{1}{2}$ by 1 inch. The above proportions bespeak a limb-bone about the same length as the preceding. What seems to be the distal end of this bone is obliquely truncate to form the joint surface, which is 1 inch 9 lines in length, 10 lines in breadth; a circular portion at one end of the surface is feebly concave; a similar portion at the opposite end is moderately convex; the intervening broader part is convex across the shorter diameters, concave in the opposite direction. A non-articular part, *g*, extends partially beyond one end of the oblong articular surface; the opposite end forms a well-marked tuberosity. The indications of muscular attachments are those of forcible applications of the limb to which this bone belonged.

Dermo-skeleton.—A portion of the foremost, or one of the foremost, segments of the tail-sheath has been left free between the sacral dermo-skeleton and the anterior of the series of dermo-caudal segments. The terminal part of the osseous tail-sheath (Plate 36, figs. 1, 2, and 3), estimated by the pairs of processes, includes five anchylosed segments. The upper or dorsal tuberosities (*a* and *b*) are developed on three of these segments, the right tubercle projects from the fourth segment, the left being indicated by a low ridge and the groove dividing it from its fellow. On the fifth of this welded series the tuberosities are indicated by obtuse ridges and their dividing grooves, beyond which the sheath, which had gradually lost breadth and thickness, narrows to an obtuse end. In the first and second of these segments the lateral, *b*, as well as dorsal, *a*, tubers continue to be developed; in the third they are represented by ridges; in the fourth they are continued as low ridges to the end of the sheath. The contrast with the huge tuberosities at the corresponding part of the tail-sheath of *Megalania* is extreme.

The fore end of the foremost of the five segments, Plate 36, fig. 3, shows a thin obtuse margin, suggestive of some free motion of the so-armoured end of the Meiolanian tail. The free articular fore end of this terminal part of the tail-sheath shows the smooth inner surface, rather less curved, crosswise above; the wall of the cylinder gains thickness as it approaches the next segment, with which its anchylosis is complete, as is the case with the following four. The diameter of the fore end of the first segment is 3 inches 4 lines; the superiority of size over the corresponding vertebra of the endoskeleton is extreme. The neural spine of this vertebra, with apparently part of that of the succeeding one anchylosed therewith, has contracted confluence with the exoskeletal sheath, an attachment which extends across the portion of sheath contributed by the foremost and the next of the dermosteal cylinders.

The fore part of the thus imprisoned caudal vertebræ has been broken away, exposing a neural canal of 3 lines in transverse—its chief—diameter; the loose cancellous texture of the middle of the body of the vertebra partially fractured leaves an irregular cavity. The vertical diameter of the so-exposed part of the caudal vertebra is $1\frac{1}{2}$ inch, the transverse 1 inch; there are short lamelliform transverse processes. The disappearance of whatever soluble tissues may have occupied the space between the endo- and exoskeletons of this portion of the tail leaves a cylindrical hollow with a smooth wall of the diameters above noted, to which the enclosed vertebra is partially attached; such cavity gradually contracts as it extends onward.

The upper surface of the tail-sheath, fig. 1, Plate 37, is longitudinally grooved. The sheath terminates in an obtuse cup of bone.

The chief desiderata for completion of Meiolanian osteology are the vertebræ of the trunk, the sternum, and the bones of the limbs; more caudal vertebræ are wanting to give the precise length of the tail.

The non-Chelonian pelvic characters and confluence, as in warm-blooded Vertebrates, of the constituent bones of the pelvis, are shown in Plate 32 of the 'Philosophical Transactions' for 1886. So far as the caudal parts of the skeleton are now known, both structure and proportionate length are Saurian, not Chelonian; the great development of the dermosteal part of the tail is Mega- and Meiolanian. Not an indication of those extreme modifications of combined endo- and exoskeletons, constituting the frame of the defensive chamber of the timid Tortoise, has yet come to hand. The best preserved trunk-vertebræ support each their pair of freely jointed ribs by distinct par- and diapophyses, as in the Crocodiles, Alligators, and extinct Dinosaurian Reptiles.

I regard the modifications of trunk-vertebræ forming the basis of a "carapace" and a "plastron" as of more value in the ordinal distinction of the *Chelonia*, than the edentulous modification of the jaws. But I fully recognise such cranial modifications in Megalanian and Meiolanian Reptiles as signs of a closer affinity to the *Chelonia* than have hitherto been detected in air-breathing cold-blooded Vertebrates.

The characters which have been detailed and illustrated in previous volumes of the 'Philosophical Transactions' may be, perhaps, deemed to support a distinct Reptilian sub-order, for which I venture to propose the name CERATOSAURIA; the representative genera at present recognised are *Megalania* and *Meiolania*.

ADDENDUM.

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The base of the skull gives characteristic evidence of the position of the extinct species in the Reptilian class. The position of the palatal nostril in the Chelonian order resembles that in the Lacertian; the narial passage descends from the outer nostril, is vertical, or nearly so, and opens upon the fore part of the bony palate; the maxillary as well as the palatine, with in some species also the premaxillaries as well as the vomer, contributing to form the palatal nostril.

In *Meiolania* the palatal nostril yields a Saurian character. From the single anterior nostril, which opens upon the fore end of the skull, the nasal passage is continued backward for 4 inches, and terminates in a transverse slit-like aperture, Plate 32, h', $1\frac{1}{2}$ inch in extent, and one-third of an inch in vertical diameter. It is formed or bounded in great proportion by the pterygoids, and completed beneath by the palatines. The pterygoids extend about 1 inch further back, and terminate obtusely. The basis cranii between and behind these narrows from the basisphenoidal portion to the basioccipital, which terminates in the lower part of the condyle here visible.

The lower surface of those massive extensions of bone from the exoccipital and alisphenoid elements expand, as they recede from the cranium proper, to support the strong bony roof of the skull, from which the horny, defensive weapons are developed; these extensions contribute at their under surface the articular cavities for the condyles of the lower jaw.

No cranium of a Vertebrate, which has come under my ken, has contributed so large a proportion of bone for mechanical needs outside, and in super-addition to, the parts forming the walls of the brain chamber.

The palatal or posterior opening of the nasal passages is anteriorly situated in *Chelonia* and *Lacertilia*, where those passages are vertical or nearly so; it is at the hindmost part of the bony palate in existing species of *Crocodilus*, and in a more advanced position, though still in the hinder half of the palate in the Mesozoic Crocodiles. In *Chelonia*, as in *Varanus* and most *Lacertilia*, its boundary includes parts of the vomer, the palatine, and maxillary bones; in *Iguana* it includes also part of the premaxillary. In *Crocodilus* it is wholly surrounded by the pterygoids; but in *Teleosaurus* the palatines combine with the pterygoids to complete it anteriorly.*

Description of Plates 31–37.

PLATE 31.

Skull of *Meiolania platyceps*, side view.

PLATE 32.

Skull of *Meiolania platyceps*, base view.

PLATE 33.

Upper view of cranium, *Meiolania platyceps*.

PLATE 34.

Skull of *Meiolania platyceps*, back view.

PLATE 35.

Vertebræ of *Meiolania platyceps*.

Fig. 1. Front view of a dorsal vertebra.
Fig. 2. Side view of the same.
Fig. 3. Back view of the same.
Fig. 4. Centrum or body of the foremost caudal vertebra.
Fig. 5. Side view of an anterior caudal vertebra.
Fig. 6. Upper view of the same vertebra.

* "Fossil Reptilia of the Wealden Formations" (1873), p. 4.

PLATE 36.

Fig. 1. Proximal articular end of a limb-bone (*tibia*).
Fig. 2. Front view of the same bone.
Fig. 3. Side view of the same bone.
Fig. 4. Distal articular end of the same bone.
Fig. 5. Front view of the radius.
Fig. 6. Distal articular end of the same bone.
Fig. 7. Sternal arch, front view.
Fig. 8. Left end of the same bone.
Fig. 9. Right end of the same bone.
Fig. 10. Dermal ossicle of trunk.

PLATE 37.

Coalesced terminal segments of the dermal bony tail-sheath.

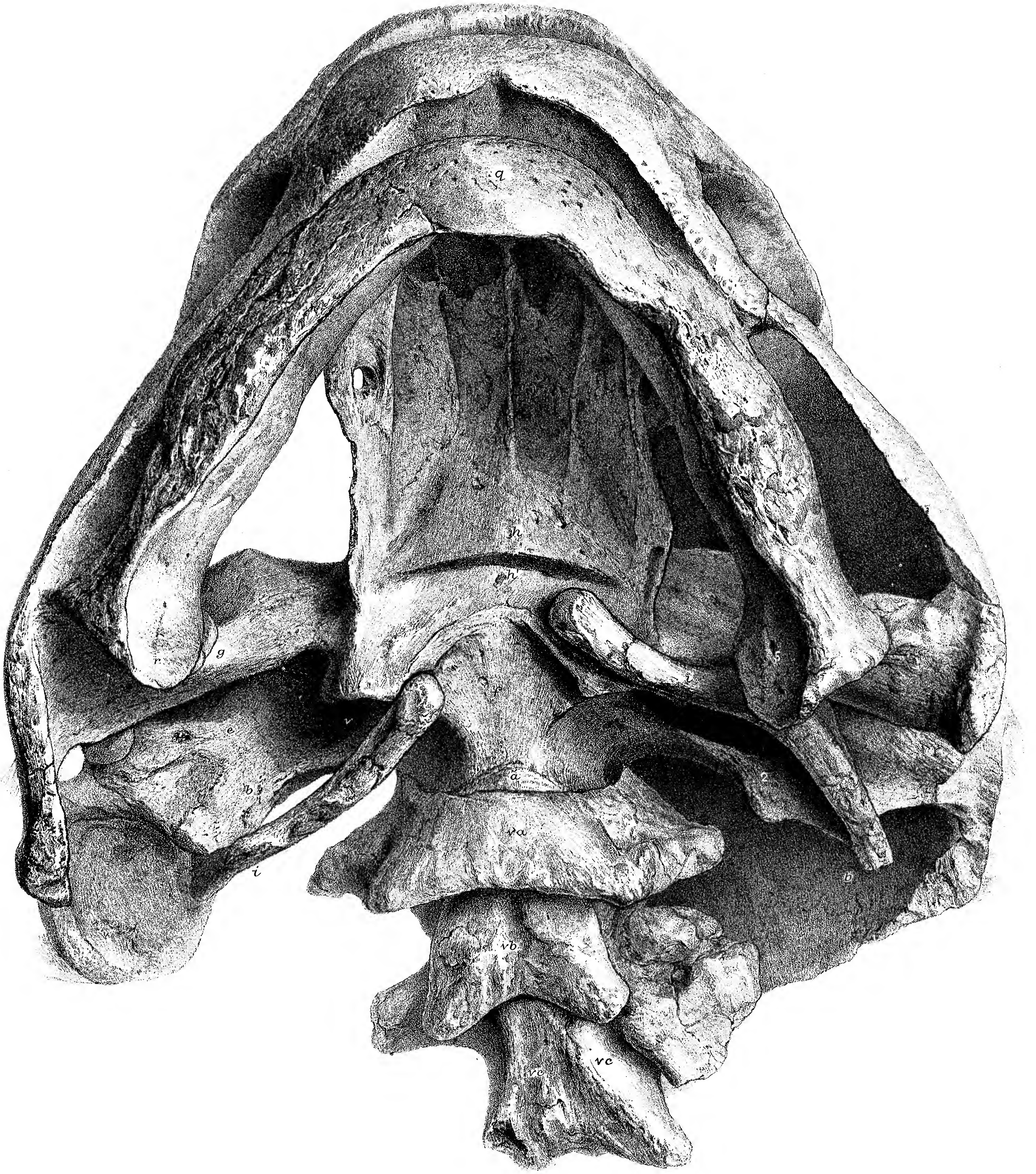
Fig. 1. Upper view.
Fig. 2. Side view.
Fig. 3. Anterior end view, with coalesced endoskeletal vertebra.

(All the Figures are of the natural size.)

Side view of skull of Meiolania platyceps.

W.H. Wesley ad nat. lith.

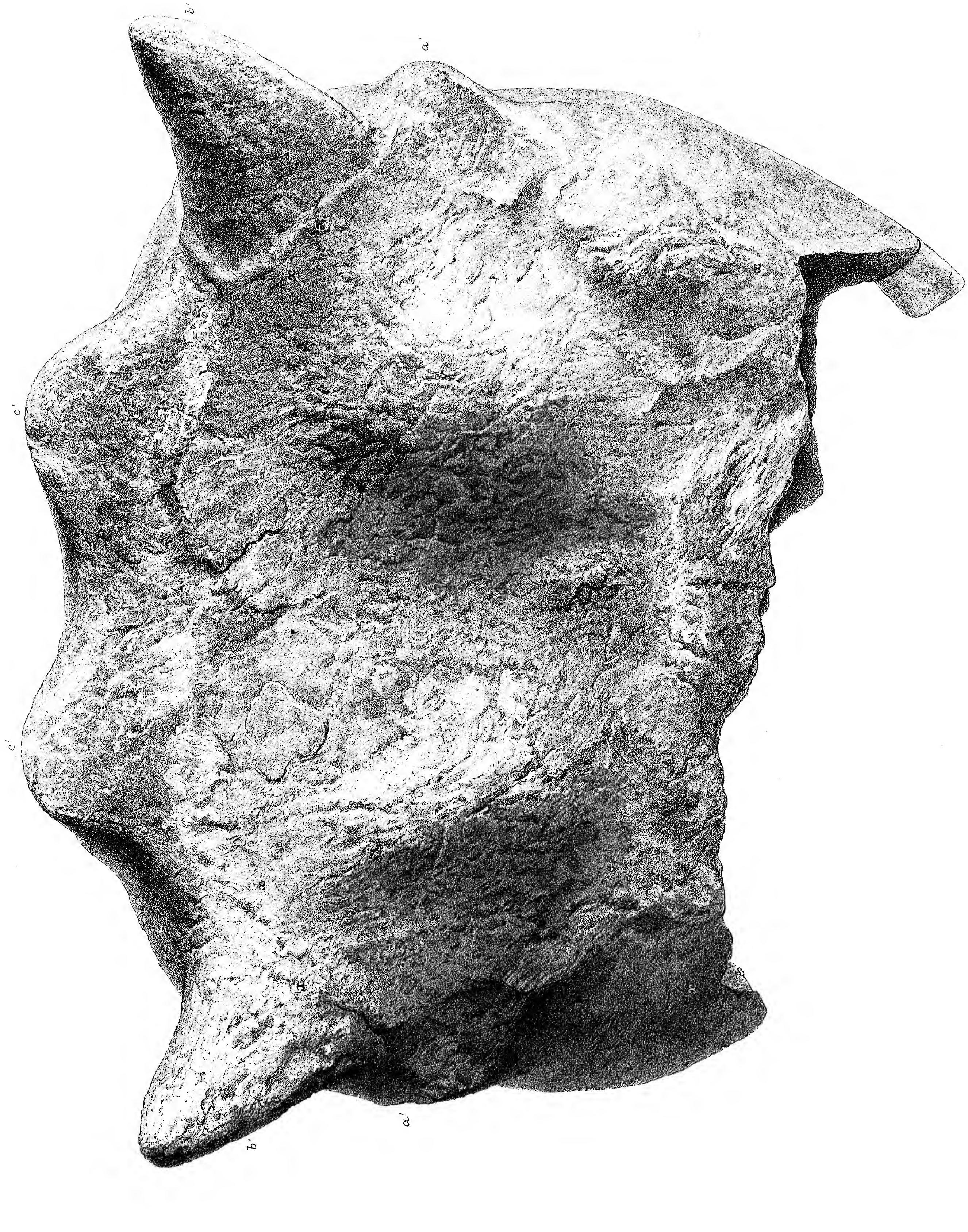
West Newman & Co. imp.



W.H. Wesley ad nat lith.

West, Newman & Co. imp.

Base view of skull of Meiolania platyceps.



UPPER SURFACE OF HINDER PORTION OF CALVARIUM. MEIOLANIA PLATYCEPS.

W. H. Wesley ad nat. lith.

West, Newman & Co. imp.

BACK VIEW OF THE SKULL OF MEIOLANIA PLATYCEPS.

W.H.Wesley ad nat. lith.

West, Newman & Co. imp.

Fig. 1.

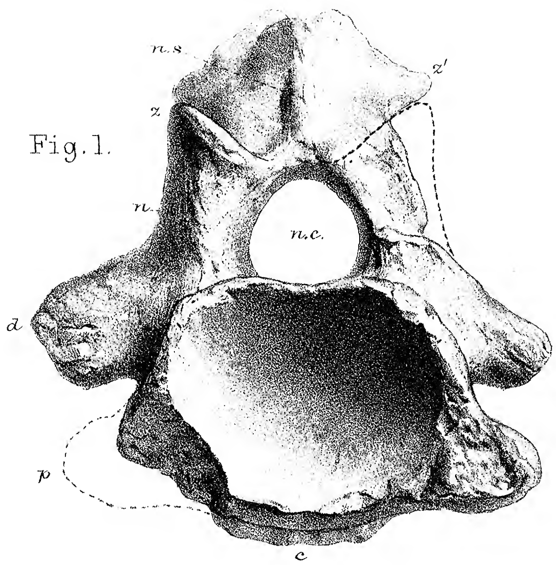


Fig. 5.

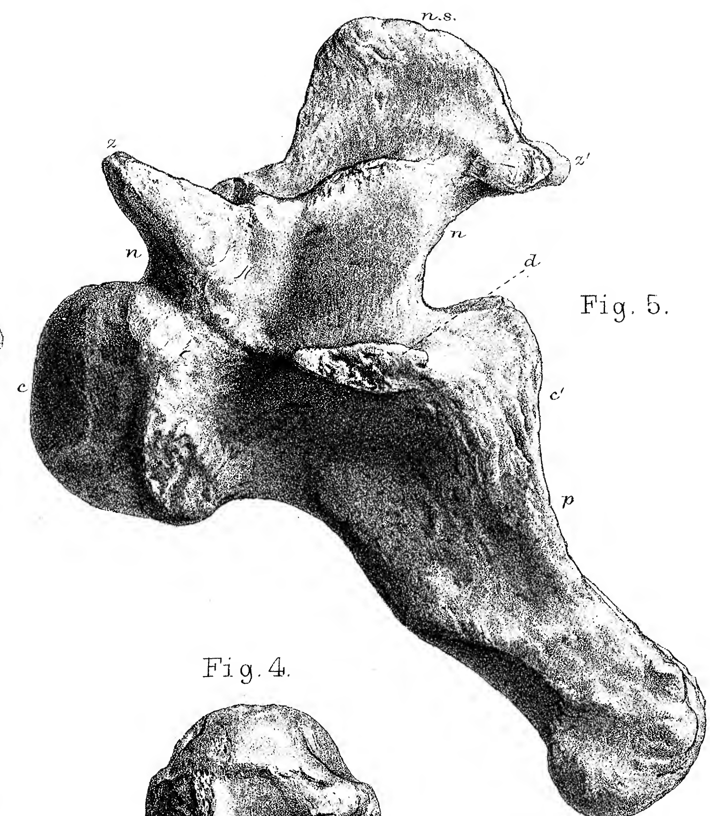
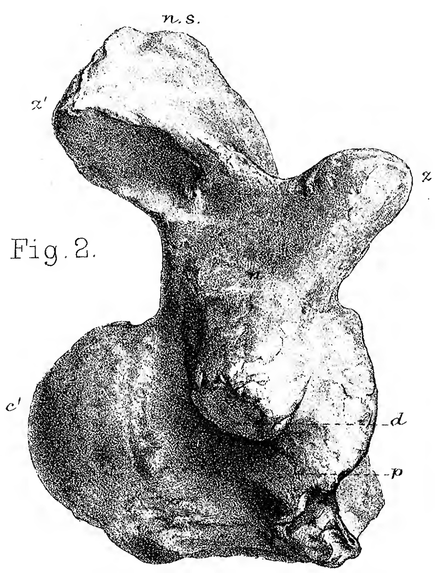


Fig. 2.



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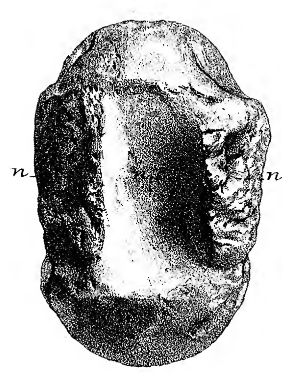

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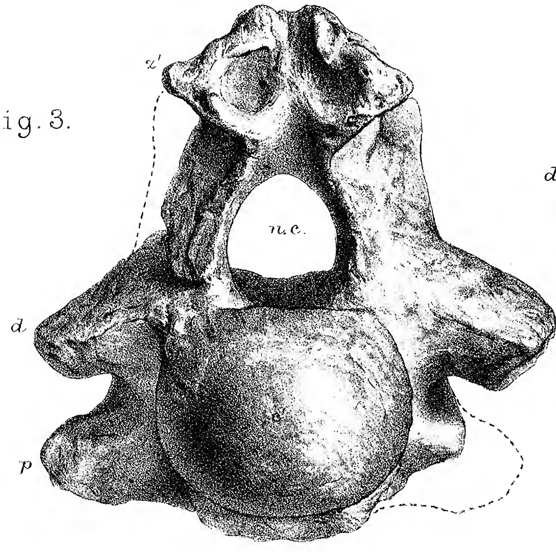

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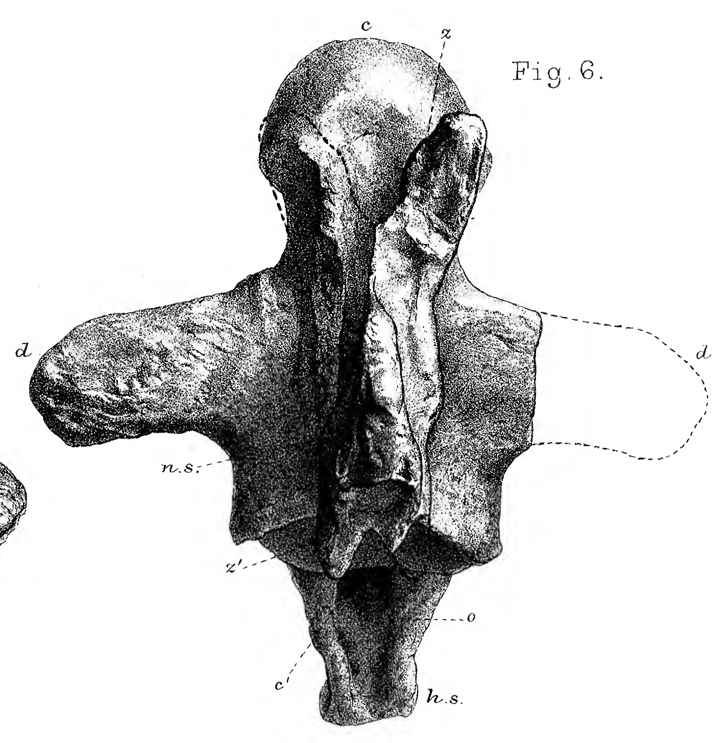

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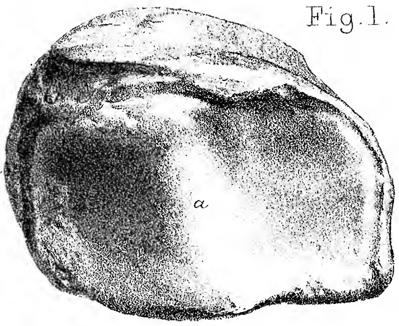

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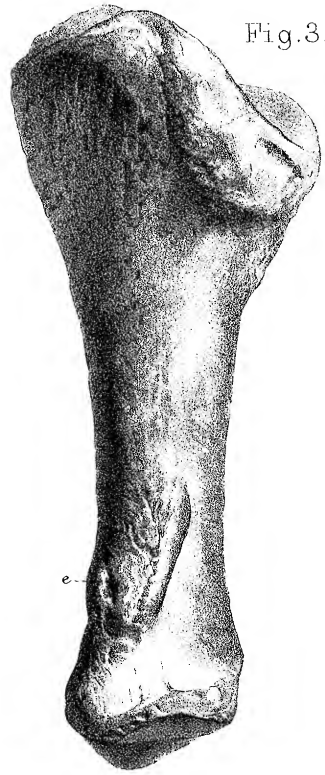

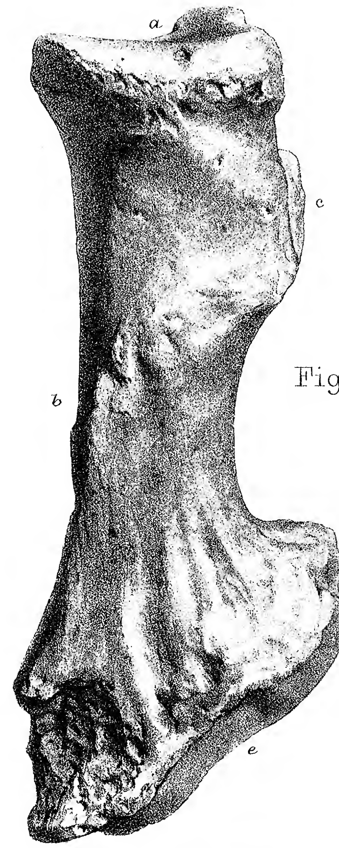

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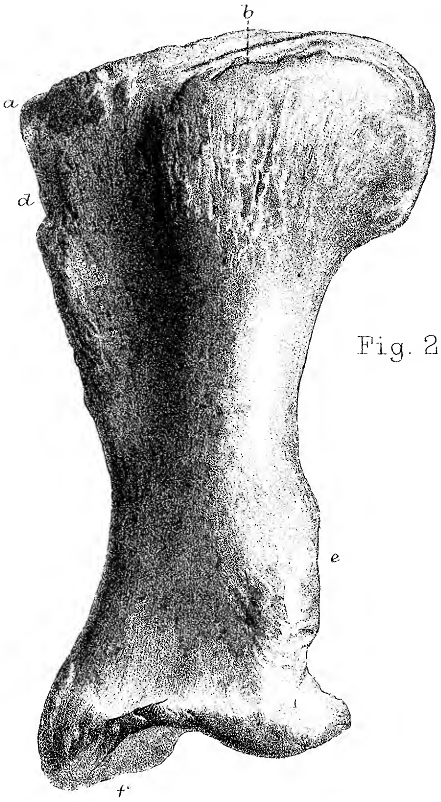

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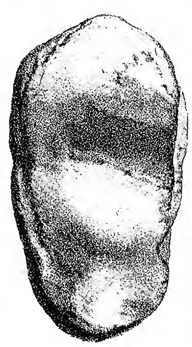

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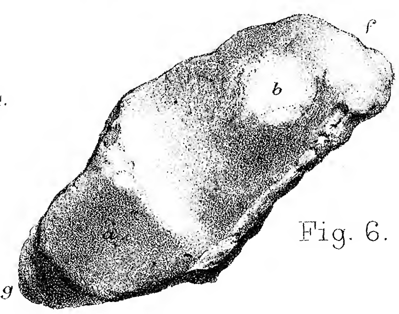


Fig. 6.

Fig. 7.

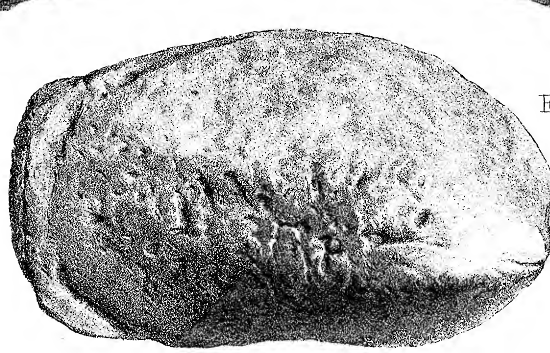
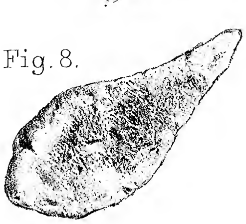


Fig. 10.

Fig. 8.



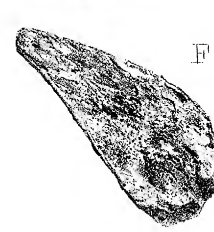
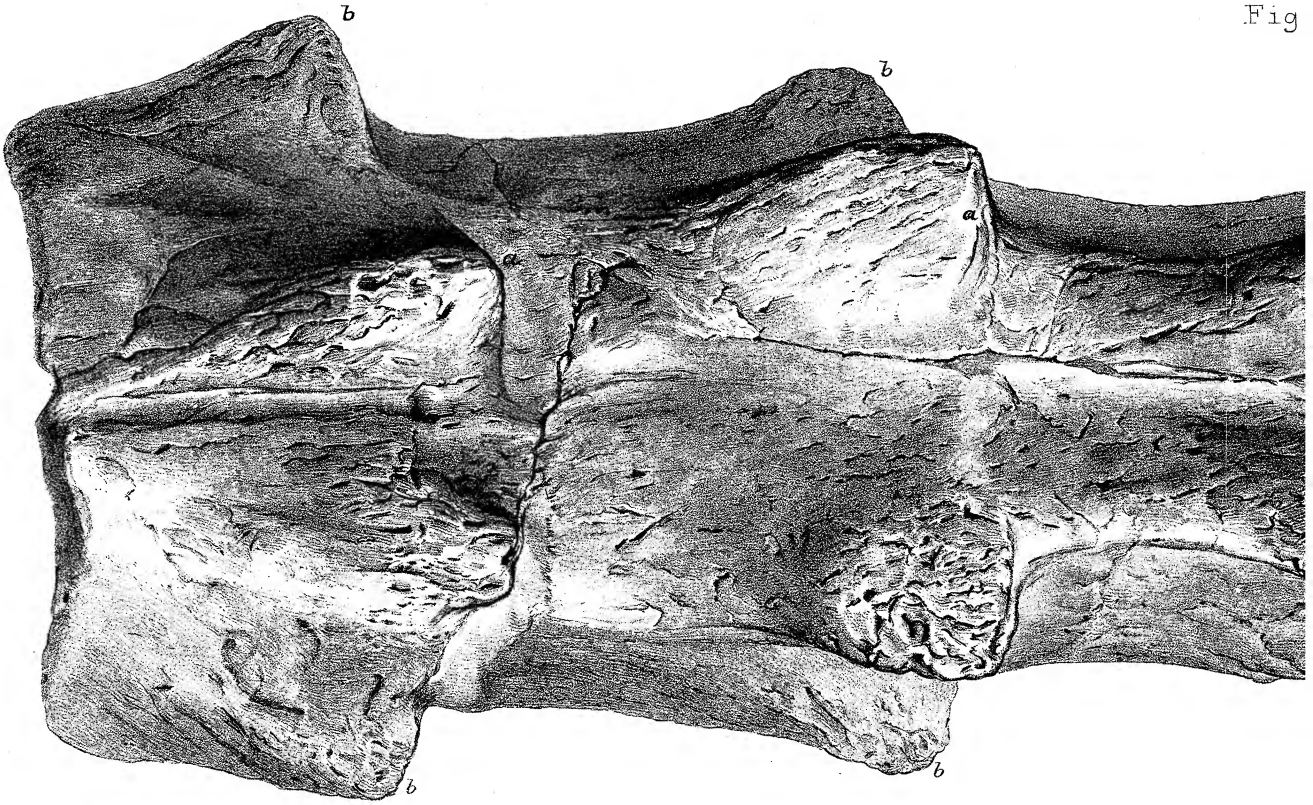


Fig. 9.

W. H. Wesley, ad. nat. lith. West, Newman & Co. imp.

Owen.

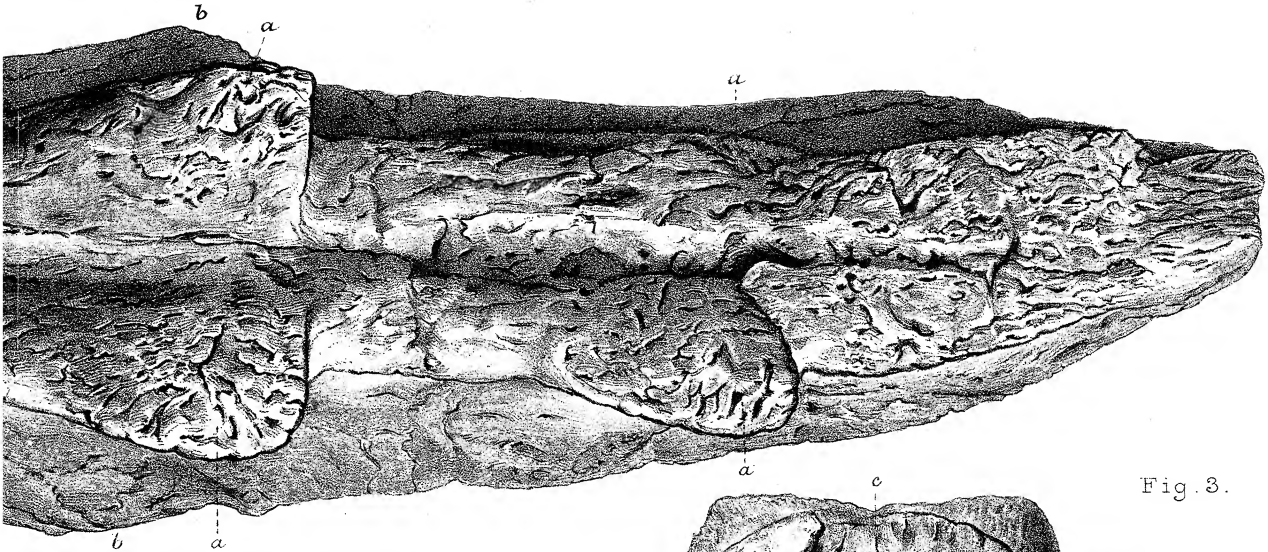
Fig



Coalesced terminal segments of the derma
Meiolania platyceps.

Fig.

Fig. 1



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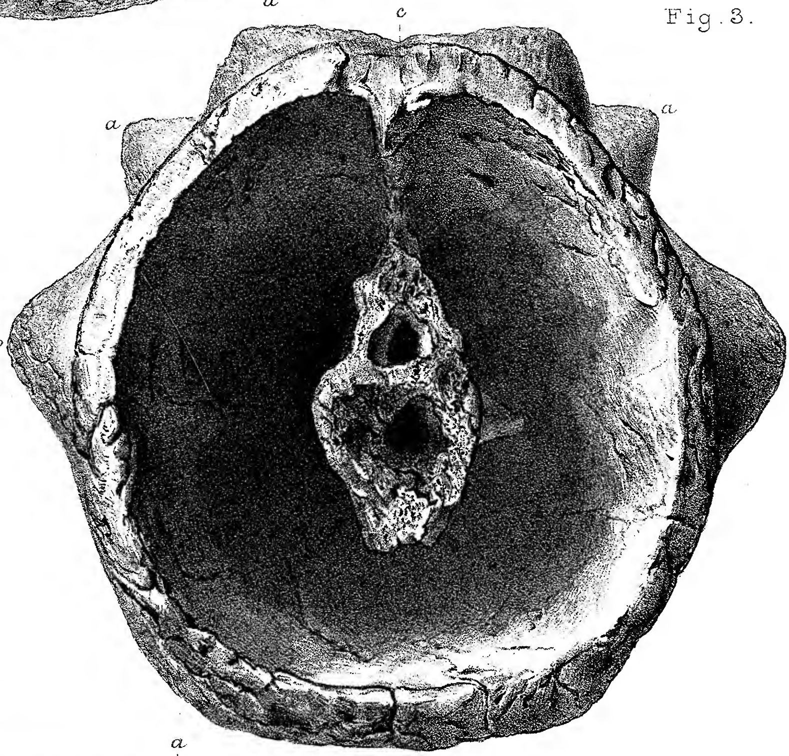
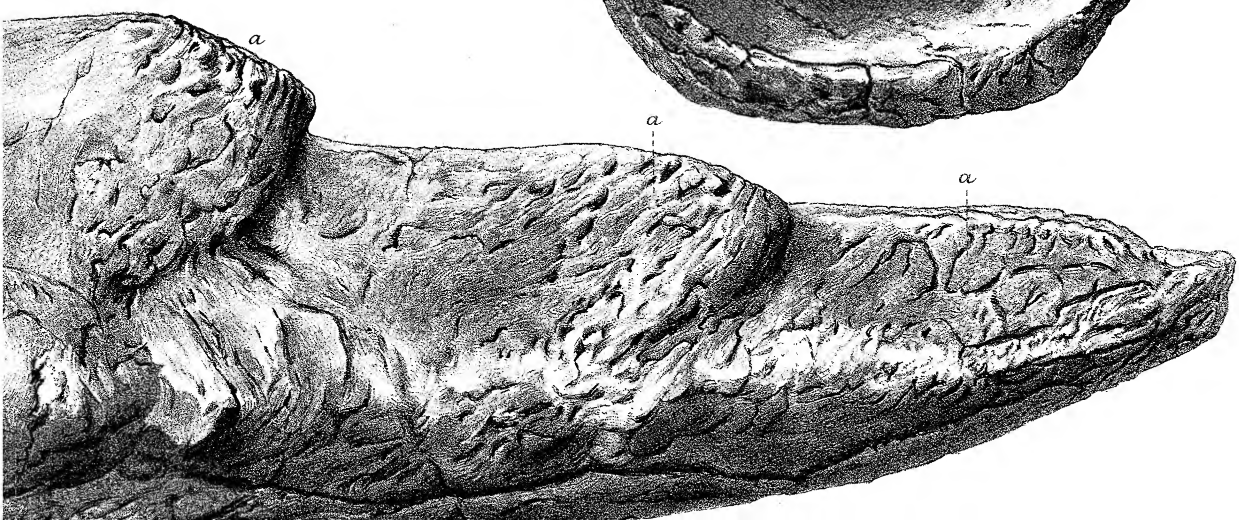
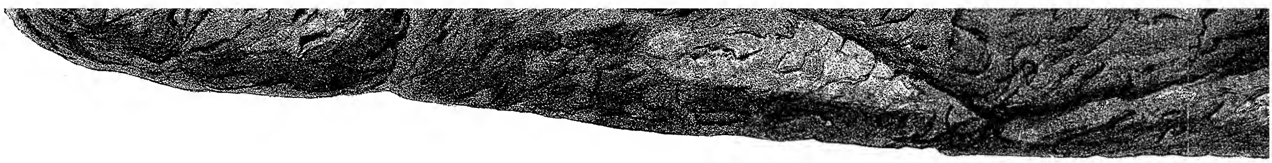


dermal tail-sheath,

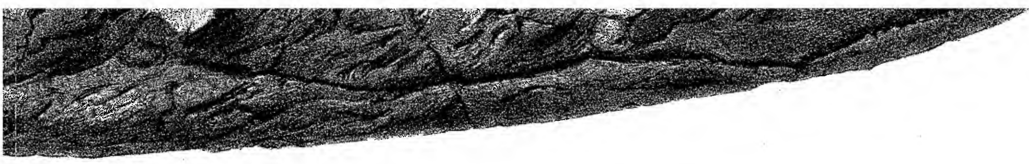
s.

Fig. 2.





W.H.Wesley ad nat.lith.



West, Newman & Co. imp.

PLATE 31.
Skull of *Meiolania platyceps*, side view.

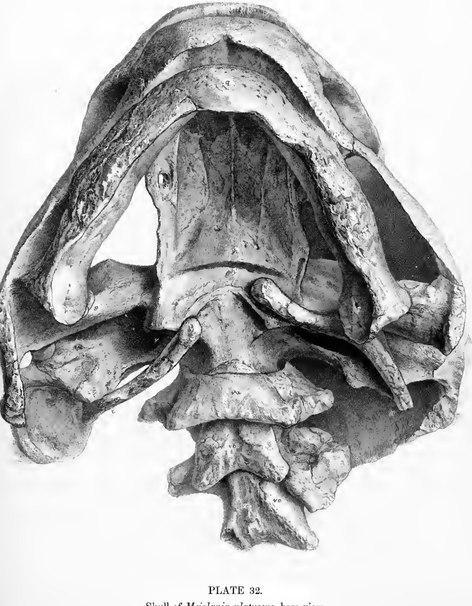


PLATE 32.
Skull of *Meiolania platyceps*, base view.

PLATE 33.

Upper view of cranium, *Meiolania platyceps.*

PLATE 34.
Skull of *Meiolania platyceps*, back view.

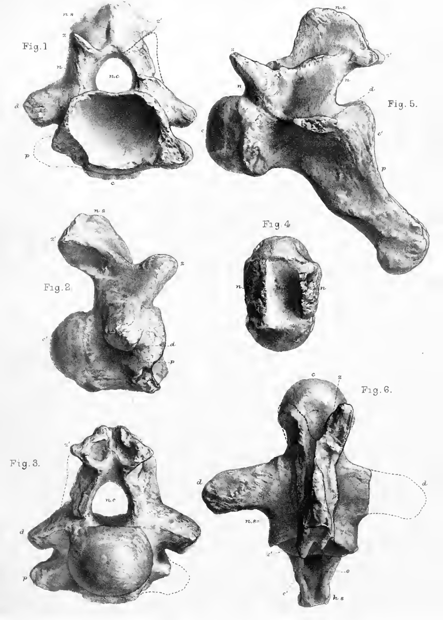


PLATE 35.

Vertebræ of *Meiolania platyceps.*

Fig. 1. Front view of a dorsal vertebra.
Fig. 2. Side view of the same.
Fig. 3. Back view of the same.
Fig. 4. Centrum or body of the foremost caudal vertebra.
Fig. 5. Side view of an anterior caudal vertebra.
Fig. 6. Upper view of the same vertebra.

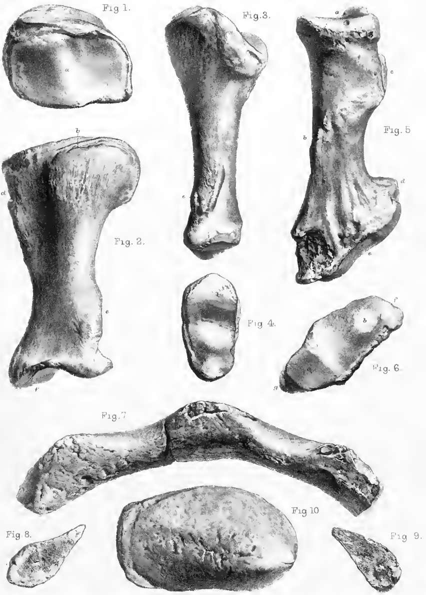
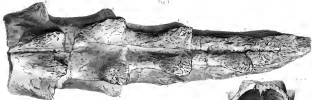
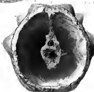


PLATE 36.

Fig. 1. Proximal articular end of a limb-bone (*tibia*).
Fig. 2. Front view of the same bone.
Fig. 3. Side view of the same bone.
Fig. 4. Distal articular end of the same bone.
Fig. 5. Front view of the radius.
Fig. 6. Distal articular end of the same bone.
Fig. 7. Sternal arch, front view.
Fig. 8. Left end of the same bone.
Fig. 9. Right end of the same bone.
Fig. 10. Dermal ossicle of trunk.

Fig. 1





[illegible]

Fig. 2

Owen.

Fig

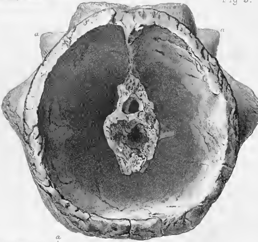
Coalesced terminal segments of the derma

Meiolania platyceps.

Fig

Fig 1

Fig 3.



dermal tail-sheath

s.

Fig 2

H Wesley ad nat lith

West, Newman & Co. imp.